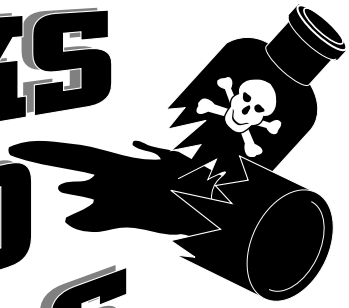
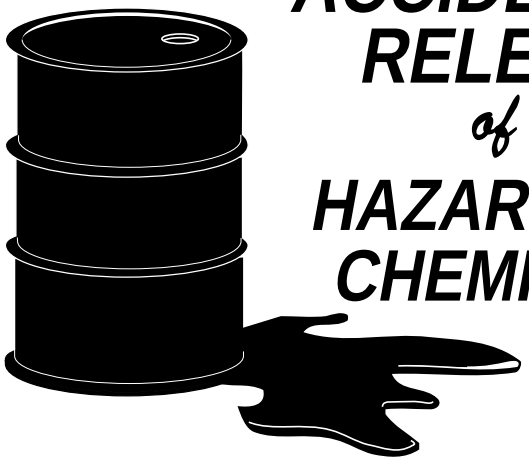
INSTRUCTOR'S GUIDE

WITH STUDENT HANDOUT

LEAKS AND SPILLS



WORKER RESPONSE to the ACCIDENTAL RELEASE of HAZARDOUS CHEMICALS



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INSTRUCTOR'S GUIDE

WITH STUDENT HANDOUT

Produced and developed by the
Industrial Hygiene and Safety Group / ESH-5
Los Alamos National Laboratory

Instructor's Guide: Written by Rob Nicholas and Helena Whyte. Cover Design by James M. Mahan. Page layout by Rosalie Ott.

Video: Produced, Directed, and Written by Rob Nicholas. Director of Photography and Editor, Larry Gibbons. Original Music by Jeff Nelson. Narrated by Rob Nicholas. Technical Advisors, Jeff Schinkle, IHIT, and Michael R. Alexander. Executive Producer, Helena Whyte, FAIC, CPC. Project Manager, Barbara C. Hargis, CIH, CSP.

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INTERNATIONAL FILM AND VIDEO ★ FESTIVAL ★
AWARD WINNNER

Leaks and Spills received the *Certificate for Creative Excellence* in the category of "Writing, Concept" from the U.S. International Film and Video Festival. Sponsored by the United States Festivals Association, this festival is the world's largest competition honoring sponsored and independently produced business, television, and industrial and informational film and video productions. Over 1500 entrants were considered from 35 different countries.

Contents

Leaks and Spills

Total Running Time: 16 minutes; Black-and-White to Color; VHS

1. Overview

Leaks and Spills instructs chemical workers how to respond to accidental chemical releases. The video dramatizes three different accidental releases: (1) a chemical spill that always requires an emergency response; (2) a spill that may or may not require an emergency response, depending upon specific circumstances; and (3) an incidental release that never requires an emergency response. Through the comparison of each dramatized spill, the concepts of "emergency response," "accidental release," and "incidental release" are defined. *Leaks and Spills* then describes the known and unknown conditions for each spill, the proper actions to take, and any factors that can influence those actions, as well as the role of 911 in any emergency situation. Because the response to some accidental releases is not always absolute, the video closes by emphasizing the need to interpret each spill separately.

2. Background

Target audience — *Leaks and Spills* is designed for all chemical workers within the Department of Energy complex, where ages range from 18 to 65, and educational backgrounds range from high school diploma to post-doctorate degree. Also, some viewers may experience English as a second language. Elementary concepts and language are therefore defined for select viewers without compromising overall interest for the general audience.

Development — *Leaks and Spills* presents "pre-awareness level" training for all chemical workers. It is not Awareness Level or First Responder training. Instead, it is designed to accompany Hazard Communication (HAZ COM) Training, taking the viewer up to, but not including, Hazardous Waste Operations (HAZWOPER) requirements.

Definitions and terminology for the key concepts of "Emergency Response," "Incidental Release," and "Conditions for determining an emergency response" were taken from the HAZWOPER Standard and the Occupational Safety and Health Administration (OSHA) Interps.

3. Uses for this video

Leaks and Spills may be used as

- ✔ The last portion of HAZ COM Training
- ✔ Refresher training for chemical user groups

4. Before showing this video

Before showing *Leaks and Spills*, you should finish reading the Instructor's Guide, preview the video, and identify any information that may differ from specific practices at your facility.

You may want to provide handouts for your viewers. A *Leaks and Spills* student handout is provided as an attachment with this guide for easy photocopying.

A table of possible emergency telephone numbers is also provided with the outline. You may ask your viewers to fill in the specific numbers for your facility, or you may want to provide a separate card listing the necessary telephone numbers.

5. Showing this video

Because video monitors are relatively small, groups viewing *Leaks and Spills* should be limited in size so that everyone can easily see and hear the video. If small groups are not feasible, two or more video monitors may be necessary.

6. Learning objectives

After the viewers have watched *Leaks and Spills,* they will be able to recognize

- ✔ Three different leak and spill sequences which may be encountered
- ✔ The appropriate action to take in each instance
- ✔ The definition of an emergency response
- ✔ The importance of calling 911 as the best action to take in the event of an emergency

7. Discussion questions and review

Suggested Questions — After showing *Leaks and Spills***,** you may want to pose the following questions as a review:

- ✔ What is an emergency response?
- ✔ When is an emergency response required?
- ✔ What is an incidental release?
- ✔ When can you clean up the chemical leak or spill yourself?
- ✔ If you are not certain you can clean up the leak or spill, who do you contact?
- ✔ What is your emergency number?

Video Case Studies — You may want to show each black-and-white spill sequence again and ask students to identify what is right and what is wrong in each case.

Additional Case Study — The following case study is offered as an example of an actual spill occurrence. You may wish to substitute or add to this case study with examples from your own facility.

*In May 1994, at Los Alamos National Laboratory, at a TA-3, SM-31 warehouse, two 500-milliliter bottles of tetrahydrofuran (THF) were damaged during handling in preparation for repackaging and subsequent distribution. The first broken bottle leaked most of its contents into the absorbent packing material. However, because of the chemical's high vapor pressure, three workers inhaled THF vapors and were taken to the Los Alamos Medical Center for treatment.

Because of the high flammability of THF, the audible alarms were manually activated and personnel were evacuated from the building. Emergency Management and Response was called to handle the spill.

The three workers inhaled enough vapor to cause acute adverse affects (such as excess mucus in the throat). They were released from the medical center after a few hours with no further symptoms related to the THF exposure. (DOE Report: ALO-LA-LANL-MATWAREHS-1994-0005)

LESSONS LEARNED

•Handling of chemicals requires special procedures because of the inherent chemical hazard posed to workers and the environment. Reducing the number of times a chemical carton is handled helps reduce the potential for chemical spills or damage to chemical containers.

•Spill prevention measures should be developed, agreed upon, and implemented in safety plans and standard operating procedures (SOPs) for operations involving chemicals.

•In the absence of effective engineering or administrative controls, personal protective equipment (PPE) should be used when handling chemicals. Special chemical handling procedures should be written down and periodic training and refresher training should be provided for workers.

•A periodic review and update of the on-site chemical storage inventory, along with guidelines for disposing of surplus chemicals that exceed their shelf-life, should be submitted to the facility manager as part of an on-site review process.

*Case study summary provided by the ES&H Training Group, Los Alamos National Laboratory

8. Follow-up activities

To support *Leaks and Spills*, it is important that you and your students review

- ✔ Your chemical inventory
- ✔ Your site emergency plan
- ✔ Your facility spill prevention and countermeasure plan
- ✔ Facility-specific training for
  - spill response and clean-up
  - use of spill kits
  - waste handling, storage, and disposal

9. Additional resources

The ACS Guide for Chemical Spill Response Planning in Laboratories, (1995) available free from the American Chemical Society, Washington, DC.

Chemical Emergency Procedures, *Safety and Health in the Use of Chemicals at Work - A Training Manual,* (1993) pp. 37-45, International Labour Office, Geneva, Switzerland (ISBN# 92-2-106470-0).

Leaks and Spills Student Handout

➤ EMERGENCY RESPONSE

An emergency response is a response from outside the immediate release area that usually involves organizations such as a hazardous materials response team or the fire department.

➤ ACCIDENTAL RELEASES

For hazardous chemical leaks and spills, there are three kinds of accidental releases that may or may not require an emergency response.

Releases that ALWAYS require an emergency response from outside the release area

These meet at least one of the following conditions:

- Immediately dangerous to life or health (IDLH) conditions
- Potential fire or explosion hazards
- Potential exposure to high levels of toxic substances
- Employees not trained to clean up the spill
- Unclear conditions of the release
- Lack of important chemical data
- A need for employee evacuation
- An emergency response predetermined by an SOP or the local emergency plan

IMMEDIATE ACTIONS you should take:

- Call 911 from a safe distance.
- Secure operations.
- Secure the danger area.
- Notify your supervisor.

Releases that MAY OR MAY NOT require an emergency response from outside the release area

These releases are due to specific circumstances, such as:

- The properties of the substance
- The circumstances of the release
- Contributing factors in the work area

IMMEDIATE ACTIONS you should take:

- Notify your supervisor.
- If your supervisor is not available, notify your emergency response provider.
- If none of the above is available, call 911.

"Incidental" releases that NEVER require an emergency response from outside the release area

Incidental releases are limited in quantity, exposure potential, or toxicity.

IMMEDIATE ACTIONS you should take:

- If you are properly trained, control the spill in the immediate release area.
- Use proper clean-up procedures.
- Use adequate personal protective equipment and other appropriate materials, such as spill kits, to clean up the spill.
- Meet all waste storage and disposal requirements.

All appropriate response, clean-up, and waste disposal decisions will be determined by the conditions of the release itself.

Containers, spill kits, paper products, and any other equipment used to contain or clean up hazardous materials may be considered hazardous or mixed waste and must be stored and disposed of properly.

Always follow the contingency plan for reporting, clean-up, waste storage, and waste disposal information.

➤ PERSONAL EMERGENCY ACTIONS

An accidental release may create potentially dangerous conditions that require immediate personal emergency actions to protect yourself and others.

IF ...	THEN...
Chemicals get in your eyes	Flush your eyes with water for at least 15 minutes under gentle water pressure and check for and remove contact lenses.
Clothing is contaminated	Go immediately to the nearest safety shower and remove all contaminated clothing and shoes while showering the entire body.
Chemicals get on your skin	Flush your skin with water for at least 15 minutes.
Personal injury occurs	Call 911.

The following is a summary of telephone numbers that may apply to your facility:

TELEPHONE NUMBERS Response to Chemical Leaks and Spills	
Emergency number	911
Emergency response provider	
Industrial hygienist	
MSDS support	
Spill prevention coordinator	
Waste disposal	